CROSS INDUSTRY AGREEMENT

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FOR THE PREVENTION OF MICROPLASTIC RELEASE INTO THE AQUATIC ENVIRONMENT DURING THE WASHING OF SYNTHETIC TEXTILES

A·I·S·E International Association for Soaps, Detergents and Maintenance Products

CIRFS EUROPEAN MAN-MADE FIBRES ASSOCIATION

EUROPEAN OUTDOOR GROUP

EURATEX THE EUROPEAN APPAREL AND TEXTILE CONFEDERATION

Federation of the European Sporting Goods Industry

EXECUTIVE SUMMARY

In 2018 five industry organisations agreed to join forces proactively to tackle the issue of microplastics through the establishment of the Cross Industry Agreement. The signatories understood that, to further global action around the topic, a harmonised test method that would allow the collection and comparison of globally generated data was an important first step, in addition to sharing of science-based knowledge and fostering research to find suitable solutions.

Today, these organisations are proud to announce that the road towards a harmonised test method is coming to an end. The harmonised test method has been developed following extensive stakeholder engagement, and has now been handed over to CEN for use as an official CEN Standard.

The Cross-Industry Agreement community will continue to engage with CEN to advance the delivery of an official CEN standard and aims to use the harmonised test method in new research as of 2021.

In parallel to this, since the formation of the Cross Industry Agreement there have also been significant advances in the academic and industrial understanding of the topic, which have bridged a number of knowledge gaps that were subject to speculation during early discussions and are critical for future dialogue and remedial measures.

While research concludes that there are currently insufficient data to draw any meaningful conclusions about microplastic fibres toxicity, we now know that:

- Microplastic comes from a number of sources and not just from textile materials.
- All textiles release potentially problematic fibre fragments and not just synthetic textiles.
- Fibre fragmentation can occur during, and be influenced by, all phases of the product life cycle and not just during laundering.

The CIA signatories welcome policy action at an international level but recommend further research to generate fundamental data and define suitable solutions.

The finalisation of this harmonised test method leads the way for the Cross Industry Agreement to achieve their two other objectives: share information and knowledge to define common priorities to fill knowledge gaps and advise on mid/long-term measures; support and participate in industrial research activities to investigate feasible options to tackle the fibre fragmentation issue.

THE CROSS INDUSTRY AGREEMENT

In 2018 five industry organisations (AISE, CIRFS, EOG, EURATEX and FESI) agreed to proactively establish the Cross Industry Agreement and joined forces to tackle the issue of microplastics by pursuing the development of a harmonised test method, sharing science-based knowledge and fostering research to find suitable solutions. This initiative was acknowledged by the European Commission in the plastic strategy.

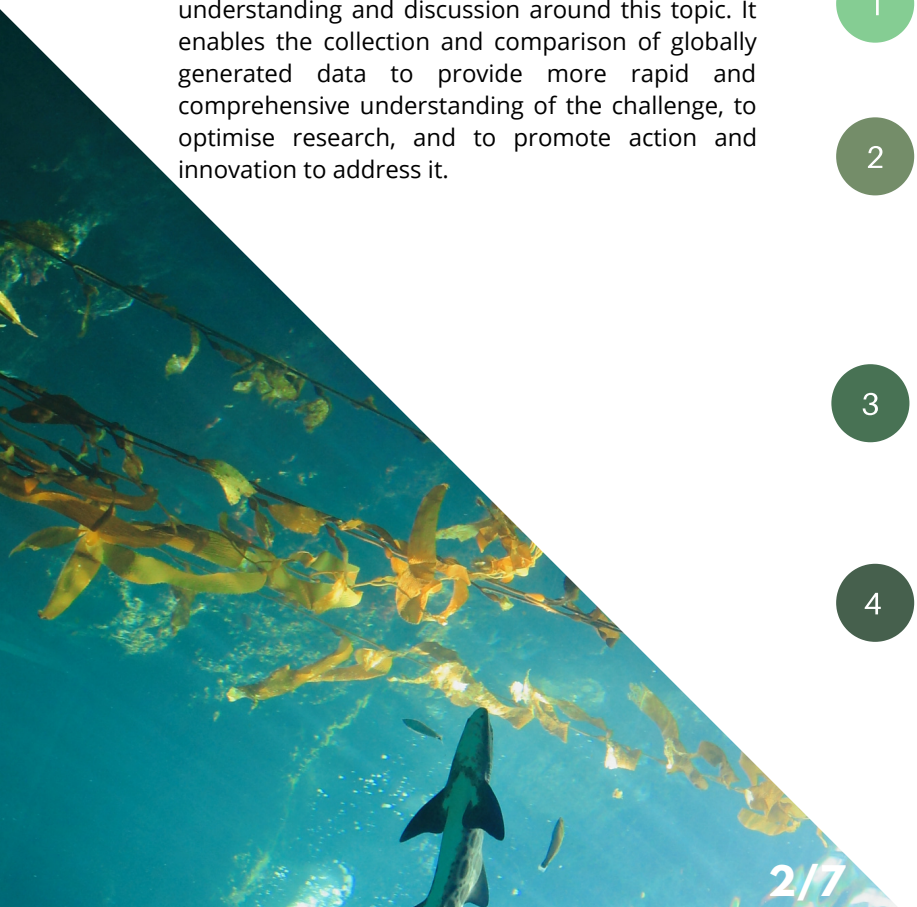
It was conceded that a scientifically valid, harmonised test method was a pre-requisite to investigate feasible options and discuss policy measures potentially addressing the unintentional release of microplastics at a global level.

Today, these organisations are proud to announce that the road towards a harmonised test method is coming to an end as agreement has been reached, following extensive stakeholder engagement. The work of the CIA research community on a harmonised test method has been handed over to CEN for fine tuning and to develop an official CEN Standard. This will enable global testing, data analysis and investigation of solutions on the issue of fibre release. This result is also offered to the European Commission and business community to support informed decision-making and further research on microplastics.

A SCIENCE BASED HARMONISED TEST METHOD

Value of a harmonised test method

A harmonised test method is of great value to the understanding and discussion around this topic. It enables the collection and comparison of globally generated data to provide more rapid and comprehensive understanding of the challenge, to optimise research, and to promote action and innovation to address it.



What is this method about?

1 **KEY AIM**
Allow for simple and effective comparison of textile fabrics.

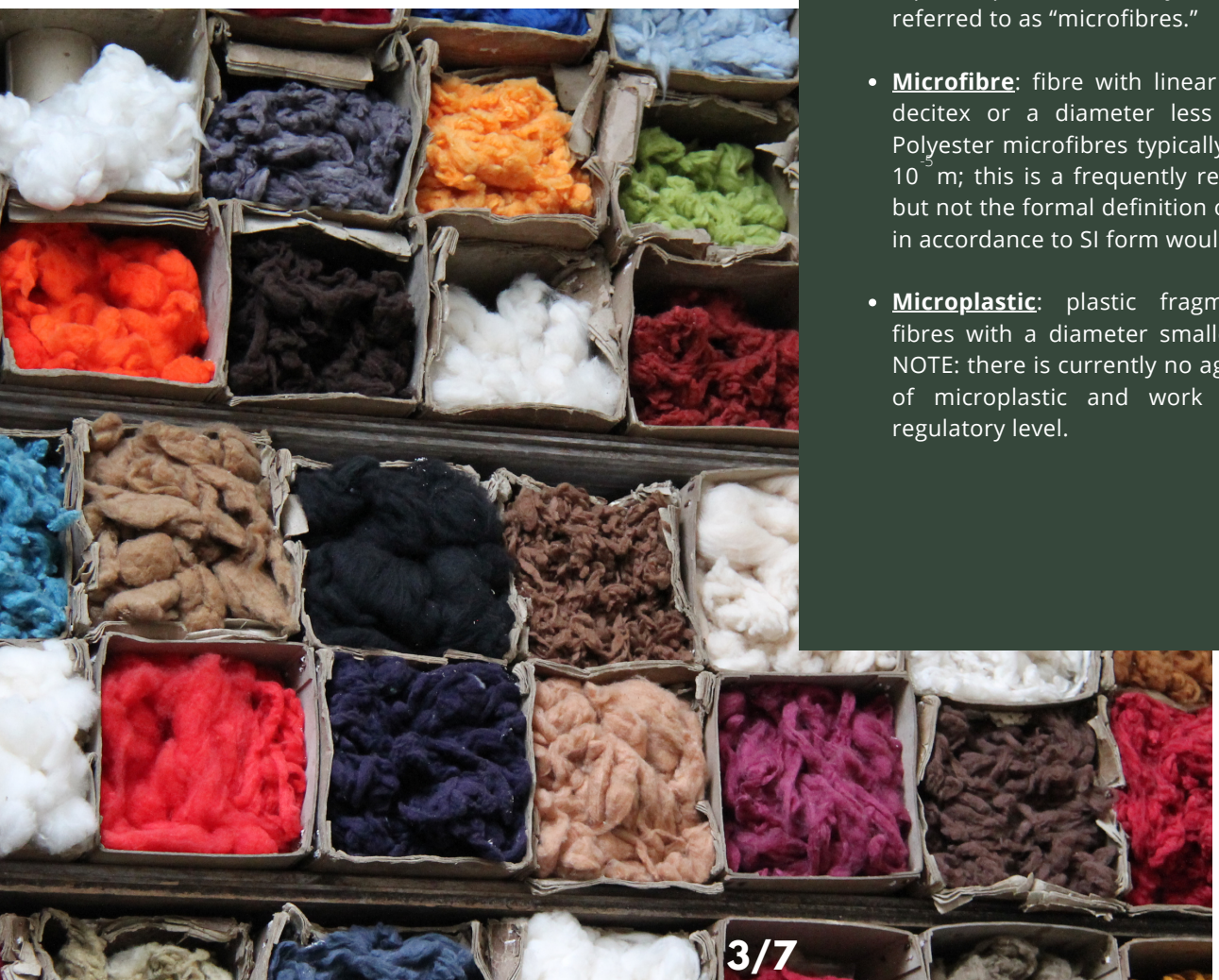
2 **DESIGN**
Be appropriate for all fibre types and fabrics structures. Ensure that any instrumentation is standard equipment commonly found in textile testing laboratories and that the method is relevant globally.

3 **PARAMETERS**
Multiple method parameters were reviewed and tested under various conditions to ensure that results were repeatable and reproducible.

4 **PRINCIPLE**
The basis of the test involves a test specimen being subjected to an accelerated laundering process under appropriate conditions of temperature, time and mechanical action. The resultant wash liquor is vacuum filtered. Fibre loss is assessed gravimetrically to approximate fibre loss during domestic laundering, however, direct correlation has yet to be determined.

WHAT DO WE KNOW NOW?

Due to the complexity and the lack of published data available during the initial stages of the dialogue on fibre fragmentation, the topic was subject to much speculation. However, since the formation of the Cross Industry Agreement, there have been a number of significant academic publications and important industry discussion related to textile fibre fragments in the environment, the associated emission routes, and the potential effects on biological organisms. These publications have contributed considerably to the current knowledge base and are important for the dialogue going forwards.



TERMINOLOGY

The term **'fibre fragmentation**' has emerged as the preferred term for this phenomenon within the textile industry. This is to avoid confusion around the widely used industry term 'microfibre', which has historically been used to describe synthetic fibres finer than one denier or decitex (having a diameter of less than ten micrometres) and a type of fabric made from these fibres, commonly used as cleaning cloths but also seen in other applications.

For the purposes of this document, the following terms and definitions apply:

- **(Textile) fibre:** unit of matter characterised by its flexibility, fineness and high ratio of length to maximum transverse dimension, which renders it suitable for textile applications.[1]
- **Fibre fragment**: short piece of textile fibre. NOTE: Fibre fragments are of particular concern as aquatic pollutants; they are often incorrectly referred to as "microfibres."
- **Microfibre**: fibre with linear density less than 1 decitex or a diameter less than 10µm. NOTE: Polyester microfibres typically have diameter of < 10^{-5} m; this is a frequently referenced dimension, but not the formal definition of a microfibre which in accordance to SI form would equal 1×10^{-6} m.
- **Microplastic**: plastic fragments, particles, or fibres with a diameter smaller than 5mm.[2],[3]. NOTE: there is currently no agreed legal definition of microplastic and work is on-going at EU regulatory level.

MYTHS AND FACTS

✗ Most microplastics come from textiles → ✓

✗ Synthetic textiles release more fibre fragments → ✓

✗ Fibre fragmentation only occurs while washing our clothes → ✓

Microplastics come from a number of sources, including the degradation of plastic debris, tyres and textiles. While some methods exist to characterise the origin of microplastics found in waters, no globally harmonised test methods are yet available.

Fibre fragmentation can originate from all textiles and therefore can be comprised of both synthetic (petrochemical) and natural (cellulose/protein) materials. All textile products and apparel experience fibre fragmentation: fashion apparel, sport/outdoor apparel, industrial textiles, home textiles, automotive textiles, geotextiles, or personal care products.

Fibre fragmentation can occur during, and be influenced by, all phases of the product life cycle, including the manufacturing process of products as well as in the consumer use, care, and disposal phases. This infographic can be used to demonstrate the multiple factors that can affect shedding as well as the multiple stages in which it can occur.

Raw Material Processing

Processing of raw materials into fibres and yarn
- Collection and conversion of raw materials
- Fibre production
- Yarn production

Material Production

Production and finishing of textile materials
- Knitting and weaving textiles
- Fabric bleaching, dyeing, finishing, and washing

Finished Product Assembly

Assembly and manufacturing of final products
- Cutting, sewing, stitching, embroidery
- Screen printing
- Product packaging

Use

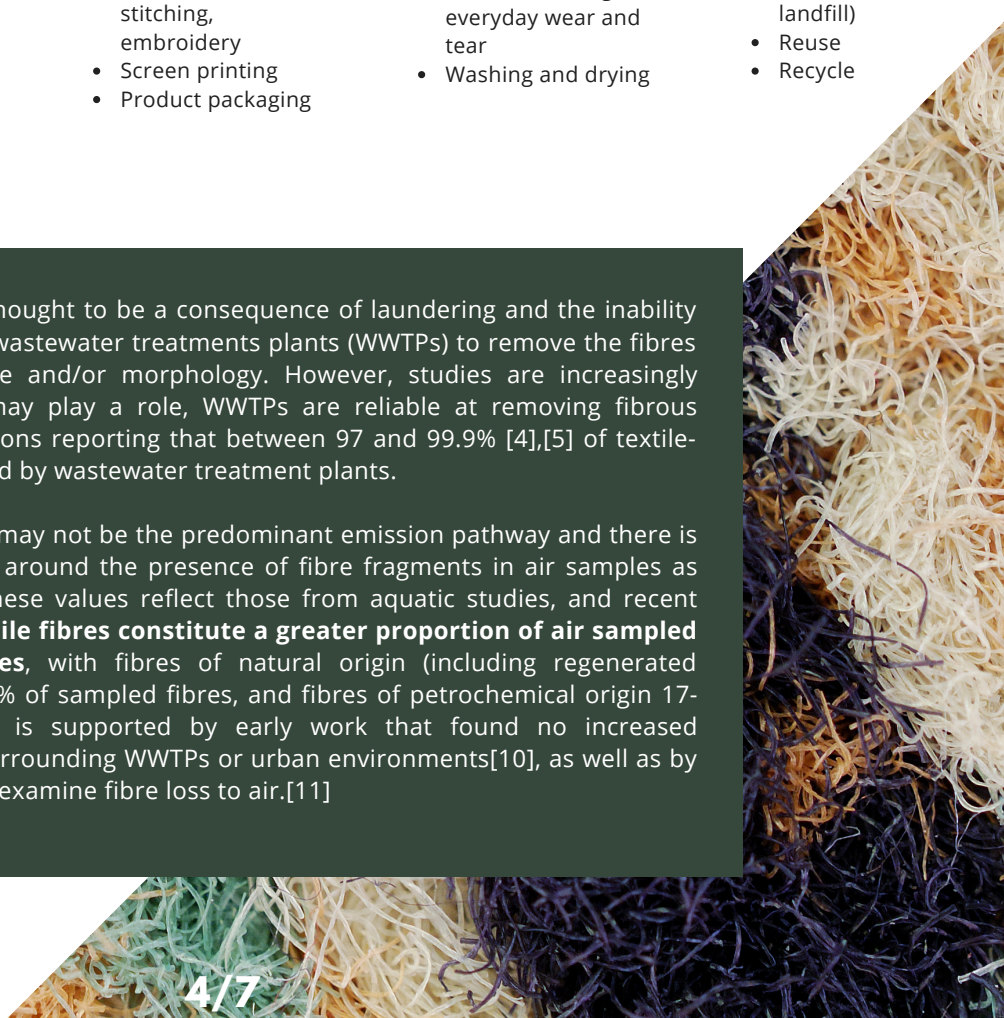
Use phase of product by end user
- Abrasion through everyday wear and tear
- Washing and drying

End of Life

Destination of product at the end of its useful lifespan
- Refuse (incinerate/ landfill)
- Reuse
- Recycle

Fibre fragmentation was originally thought to be a consequence of laundering and the inability of domestic washing machines and wastewater treatments plants (WWTPs) to remove the fibres from the effluent due to their size and/or morphology. However, studies are increasingly suggesting that while laundering may play a role, WWTPs are reliable at removing fibrous contaminants, with various publications reporting that between 97 and 99.9% [4],[5] of textile-based microplastics could be retained by wastewater treatment plants.

This suggests that home laundering may not be the predominant emission pathway and there is a rapidly growing body of evidence around the presence of fibre fragments in air samples as well as in aquatic environments. These values reflect those from aquatic studies, and recent literature suggests that **natural textile fibres constitute a greater proportion of air sampled textile fibre than synthetic fibres**, with fibres of natural origin (including regenerated cellulose) constituting around 70-75% of sampled fibres, and fibres of petrochemical origin 17-30% [6],[7],[8],[9]. This hypothesis is supported by early work that found no increased concentrations of fibre fragments surrounding WWTPs or urban environments[10], as well as by more recent studies that specifically examine fibre loss to air.[11]



RISKS

There is understandable concern around the potential impacts of fragmented fibres on the environment, marine life and human health, with potential risks coming from the physical presence of the fibres, as well as chemical additives such as antioxidants, dyes or fire retardants and transferred compounds such as persistent organic pollutants (POPs) and metals sorbed from aquatic environments.[12]

However, data in this area are extremely limited and, whilst it does indicate that microplastic fibres might lead to a range of adverse effects on marine animals and health problems in humans, a scientific perspective on microplastic in nature and society carried out by scientists advising the European Commission (SAPEA) has concluded "The best available evidence suggests that microplastics and nanoplastics do not pose a widespread risk to humans or the environment, except in small pockets. But that evidence is limited, and the situation could change if pollution continues at the current rate." [13]

Research concludes that there is currently insufficient data to draw any meaningful conclusions about microplastic fibres toxicity. Further research is urgently needed that investigates the ecotoxicological effects in species representing different environmental matrices and trophic levels. Furthermore, in depth assessment of MPFs should include investigation of the role of the additive chemicals associated with microplastic fibres as previous studies have shown the plastic leachates can elicit a wide range of effects.[14]

NEXT STEPS

The Cross Industry Agreement community will continue to engage with CEN to advance the delivery of an official CEN standard and aims at use of the harmonised test method in new research as of 2021.

The Cross Industry Agreement community also wishes to pursue a joint research project in an effort to gather mass data which is a necessary step to better understand the phenomenon. This vital comprehensive understanding of fibre fragmentation triggers can then be applied to investigate solutions and ultimately manage fibre fragmentations appropriately during the whole life cycle of products.

Launched in 2018, the Cross Industry Agreement community continues to cooperate to tackle the release of microplastic from washing of synthetic textiles in an open, transparent and inclusive manner.

POLICY MEASURES

1

The OECD 2020 workshop stated that "Policy action is needed to support the development and implementation of best practices and technological solutions which can mitigate microplastics pollution".

2

The CIA signatories welcome policy action at an international level but recommend further research work into generating fundamental data and defining suitable solutions.

3

The research will top up individual exploration efforts and create synergies to deliver solid proposals to reduce release of fibre fragments.

4

The finalisation of this harmonised test method will allow the Cross Industry Agreement to achieve their two other objectives of sharing information and knowledge in order to define common priorities to fill knowledge gaps and advise on mid/long-term measures and supporting and participating in industrial research activities to investigate feasible options to tackle the fibre fragmentation issue.

ACKNOWLEDGEMENTS

The research organisations and stakeholders mentioned hereafter participate in the Cross Industry Agreement joint efforts to tackle microplastics by developing a harmonised test method and sharing knowledge to find solutions.

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